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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/075,669	02/13/2002	Kevin E. Boyle	TRW(RG)5832	2678

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EXAMINER	
YEAGLEY, DANIEL S	

ART UNIT	PAPER NUMBER
3611	

DATE MAILED: 04/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/075,669	BOYLE ET AL.	
	Examiner	Art Unit	
	Daniel Yeagley	3611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *31-44,58 and 59* is/are pending in the application.

4a) Of the above claim(s) *37 and 38* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *31-36,39-44,58 and 59* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's original election of Species II in Paper No. 5 was previously acknowledged but because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election was treated as an election without traverse (MPEP § 818.03(a)). Pending claims 37 and 38 of the current amendment are still withdrawn from further consideration pursuant to 37 CFR 1. 142(b) as being drawn to a nonelected species, and there being no allowable generic or linking claim.

2. Regarding the newly submitted claims 58 – 59; applicant failed to indicate if the claims are readable upon the elected species as required under 35 U.S.C. 121. MPEP § 809.02(a). However, the examiner as considered the new claims with the assumption that they read on the elected species.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 31, 41, 42 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts '925 in view of Rauter et al '474.

Roberts shows a steering system *for* steerable wheels comprising an axle 16 with an intermediate portion and first and second end portions that are suspended by springs 22,24 and supports steerable wheels that are pivotally mounted on the end portions *for* pivotal movement about a pivot axis that is transverse to a longitudinal central axis of the axle 16 and a steering member 130 (figure 1), wherein the steering system includes a separate steering cylinder 32 having a longitudinal central axis and an intermediate portion that at least partially defines a chamber supporting a screw thread portion of the steering member 130; that is free of rack teeth, *for* axial movement relative to the axle (figure 2), wherein the steering system further includes at least one drive member 56 connected with an electric motor 50 and a ball nut 64 that is disposed in the chamber and associated with the screw thread portion and includes a takeoff assembly with steering linkage that is connected to the steering member and extends along an outer side of the axle to transmit movement of the takeoff assembly to the pivotally connected steerable wheels, but failed to show the steering cylinder being integral with the axle with a takeoff assembly having a portion projecting from an opening in the intermediate portion of the axle connected to the steering linkage, wherein the electric motor is effective to resist movement of the steering member toward a straight ahead position (column 1, 6).

Rauter shows a steering system *for* steerable wheels comprising an coaxial integrated axle and steering cylinder 9 with first and second end portions that support pivotally connected steerable wheels *for* pivotal movement about a transverse pivot axis (figure 1), wherein the steering axle of Rauter shows the feature of a side mounted takeoff assembly 6 at a midway location between the end portions and connected to a steering member in the axle that utilizes that art of projecting a portion of the takeoff assembly (at numeral 22) from an opening in the

intermediate portion of the axle 9 and connects to steering linkages 5 that extends along an outer side of the axle to transmit movement of the takeoff assembly to the pivotally connected steerable wheels as claimed (column 1-4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the housing of Roberts steering axle and cylinder comprising Roberts ball and nut motor driven steering member arrangement with an integral housing unit, such like that taught by Rauter; in order to achieve a considerable weight and cost advantage and provide a steering system that is fully integrated into an axle body in a coaxial arrangement to provide a load-bearing axle body and steering assembly that requires no additional space and very effectively protects the steering system against damage without additional structure as taught by Rauter and would have been further obvious to one of ordinary skill to have utilized the art of incorporating a side mounted takeoff connection means, such as suggested by Rauter, simply as an alternative connection means to alternatively connect Roberts' ball nut steering components to the pivotally mounted steerable wheel by connecting the steering linkage from the steerable wheels along side an integrated axle and steering assembly through an opening in an intermediate portion of the axle as suggested by Rauter connection means.

5. Claims 32 – 36, 39 – 40, 43 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts '925 as modified by Rauter et al '474 in further view of Ohmura et al '494.

Roberts as modified by the coaxial integrated axle and intermediate projecting steering linkage takeoff assembly of Rauter; as stated above, disclosed a steering system with an electric

motor as broadly claimed but failed to disclose electric motor being outside the chamber and failed to disclose the spring assembly as claimed.

Ohmura shows a steering system with a steering assembly in a chamber of an axle with end portions 42 (figure 2) that support rear wheels 6 (figure 1), wherein the chamber is at an intermediate portion of the axle and supports a steering member (at numeral 84) and a ball nut 34 with screw thread portion 84 (column 3, line 24-35, column 5, line 11-13) and includes the feature of positioning an electric motor outside the chamber, wherein the motor is connected with the axle by at least one drive member 88 extending through an opening in the axle (figure 2), and includes a motor control circuitry operative to cause a generation readable as being back EMF in an electric motor 32 to resist movement of the steering member toward a straight ahead position (column 3-5, line 53-10), and includes the feature of a single spring assembly 98 being disposed in the chamber as claimed which biases the steering member toward a straight ahead position that includes fixed stops 100,102 disposed in the chamber and movable stops 90,92 that are movable relative to the fixed stops (column 5) and includes a locking member 46 capable of locking the steering member in a straight ahead position (column 6, line 17-21).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the steering system of Roberts as modified Rauter with an additional steering assembly component, such as a spring assembly, in order to return the steerable wheels to a straight ahead position with a degree of certainty yielding a satisfactory reliability in case the rear-wheel turning system fails as suggested by Ohmura for obvious enhanced safety and control of the vehicle.

6. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts '925 as modified by Rauter et al '474 in further view of Shimizu '692.

Roberts as modified by the coaxial integrated axle and intermediate projecting steering linkage takeoff assembly of Rauter; as stated above, further disclosed a steering system with an electric motor connected to an output member 92 and a drive member 56 but failed to disclose the drive member being a belt extending part way around the ball nut and part way around the output member.

Shimizu discloses a steering system comprises an axle for supporting wheels (figure 1), wherein an intermediate portion of the axle includes a chamber comprising a ball nut 43 associated with a screw thread portion 42 of an elongated steering member 21 and supported in the chamber, wherein the steering member of Shimizu steering system discloses the prior art of utilizing a belt drive means for driving the steering member, wherein the drive belt is connected between the electric motor and the ball nut for rotating the ball nut to drive the steering member as claimed.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the steering system of Roberts as modified by Rauter with an alternative drive means; such as a belt, like that suggested by Shimizu drive means to drive the ball nut utilizing a belt driven steering system in place of a gear driven means, simply as a matter of design choice dependent upon users preference because belts are old and well known alternative drive means in the art.

Response to Arguments

7. Applicant's arguments filed 6/22/05 with respect to claims 31 – 44, 58 and 59 have been considered but are moot in view of the new ground(s) of rejection based on earlier cited references to Roberts as modified by Rauter; as stated above, because they are considered to more clearly distinguish the features of applicants' claims.

Although, Ohmura is not used as a base reference at this time, the examiner disagrees with applicants' assertion that Ohmura element "40" is not an axle, and does not support the rear wheels. Applicant should note that figure 1 shows element 30 being part of the axle assembly (steering member) that extends across and supporting rear wheels 6 and as further shown in more detail in figure 2, wherein the element 30 is supported within an axle, therefore the wheels are supported by the axle via the end portions of element 30.

In regards to the references cited in applicants' remarks; the references cited have been considered, but will not be listed on any patent resulting from this application because they were not provided on a separate list in compliance with 37 CFR 1.98(a)(1). In order to have the references printed on such resulting patent, a separate listing, preferably on a PTO/SB/08A and 08B form, must be filed within the set period for reply to this Office action.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Yeagley whose telephone number is (571)-272-6655. The examiner can normally be reached on Mon. - Fri; first Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lesley D. Morris can be reached on (571) - 272 - 6651. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

D.Y.

Lesley D Morris

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